WHAT IS CLAIMED IS:

1. A disk storage apparatus which can concurrently process a plurality of data streams specified by a host, in which a head reads and writes data from and to a disk, the disk storage apparatus comprising:

means for sequentially executing, in accordance with a time series, write commands with time limits provided by the host and instructing a data stream to be written and read commands with time limits provided by the host and instructing a data stream to be read;

means for detecting that an error has occurred in a write operation specified by any of the write commands; and

means for controlling the executing means, the controlling means operating if the detecting means detects that an error has occurred in the write operation specified by any of the write commands, to cause the executing means to continue the write operation regardless of whether or not a time spent performing the write operation until the present time is within the time limit specified by the write command.

2. The disk storage apparatus according to claim 1, further comprising:

means for determining whether the time spent performing the write operation specified by the write

command, until the present time, is within the time

limit specified by the write command when the

detecting means detects that an error has occurred in

the write operation; and

5   means for transferring predefined dummy data to

the host, the transferring means operating when the

time spent performing the write operation is

determined to exceed the time limit and there is

a read command waiting to be executed, to transfer

10   the dummy data to the host as read data requested by

the read command instead of executing the read

command.

3.   The disk storage apparatus according to

claim 2, wherein the control means includes:

15   means for determining whether a data stream is

being reproduced when it is determined that the time

spent performing the write operation exceeds the time

limit;

means for determining whether there is a read

20   command waiting to be executed when it is determined

that a data stream is being reproduced; and

means for activating the transferring means when

it is determined that there is a read command waiting

to be executed.

25   4.   The disk storage apparatus according to

claim 2, further comprising means for acting on

the host as in a case where the write command has been

completed correctly, when the time spent performing the write operation is determined to exceed the time limit.

5. The disk storage apparatus according to claim 4, further comprising a status register which holds a status indicative of a result of execution of the command by the executing means and which can be referred to by the host, and wherein the acting means sets, in the status register, a dummy status indicating that execution of the write command has been completed correctly.

6. The disk storage apparatus according to claim 1, further comprising means for predicting whether execution of the read command with the time limit is completed within the time limit specified by the read command, before the execution of the read command is started, and wherein if the predicting means predicts that the execution of the read command is not completed within the time limit, the controlling means forces completion of the execution of the read command by the executing means.

7. The disk storage apparatus according to claim 6, wherein if the predicting means predicts that the execution of the read command is not completed within the time limit, the transferring means transfers predefined dummy data to the host as read data requested by the read command instead of

executing the read command.

8. The disk storage apparatus according to claim 6, wherein the predicting means predicts whether execution of the read command with the time limit is completed within the time limit specified by the read command, on the basis of a position of an access start track on the disk specified by the read command, a present position of the head, and the amount of data to be read, specified by the read command, and the execution of the read command includes a seek operation of moving the head to the access start track and an operation of reading an amount of data specified by the read command from the disk after the seek operation has been completed.

9. The disk storage apparatus according to claim 8, wherein the predicting means includes:

means for predicting a seek time required to move the head to the access start track on the disk specified by the read command;

means for predicting the amount of data which can be read from an area starting with an access start sector on the access start track specified by the read command, within a remaining time obtained by subtracting the seek time predicted by the means for predicting the seek time from the time limit specified by the read command; and

means for determining whether the execution of

the read command is completed within the time limit,
the determining means determining that the execution
of the read command is completed within the time limit
when the seek time predicted by the means for
5   predicting the seek time is within the time limit and
when the amount of data predicted by the means for
predicting the amount of data exceeds the amount of
data to be read which amount is specified by the read
command, and otherwise determining that the execution
10   of the read command is not completed within the time
limit.

      10. The disk storage apparatus according to
claim 9, further comprising a seek time table
indicating, for each predefined number of tracks,
15   a correspondence between the number of tracks and a
seek time required to move the head by an amount
corresponding to the number of tracks, wherein the
means for predicting the seek time predicts the seek
time required to move the head by the amount
20   corresponding to the number of tracks, on the basis of
the number of tracks from one corresponding to the
present position of the head up to the access start
track on the disk specified by the read command as
well as the seek time table.

25   11. The disk storage apparatus according to
claim 6, wherein:
      the detecting means also detects that an error

has occurred in a read operation specified by the read command;

if the detecting means detects that an error has occurred in the read operation specified by the read command, the predicting means predicts again whether execution of the read command is completed within the time limit specified by the read command; and

if it is determined in the second prediction by the predicting means that the execution of the read command is completed within the time limit, the controlling means causes the executing means to continue executing the read command.

12. A method of controlling data streams, the method being applied to a disk storage apparatus which can concurrently process a plurality of data streams specified by a host, the method comprising:

sequentially executing, in accordance with a time series, write commands with time limits provided by the host and instructing a data stream to be written and read commands with time limits provided by the host and instructing a data stream to be read;

detecting that an error has occurred in a write operation specified by any of the write commands; and

controlling a retry of the write command so that if it is detected that an error has occurred in the write operation specified by any of the write commands, the retry of the write command is executed

regardless of whether a time spent performing the
write operation until the present time is within the
time limit specified by the write command.

13.   The method according to claim 12, further

5   comprising:

determining whether the time spent performing the
write operation specified by the write command, until
the present time, is within the time limit specified
by the write command when it is detected that an error
10   has occurred in the write operation; and

transferring predefined dummy data to the host so
that when the time spent performing the write
operation is determined to exceed the time limit and
there is a read command waiting to be executed, the
15   dummy data is transferred to the host as read data
requested by the read command instead of executing the
read command; and

wherein when the time spent performing the write
operation is determined to exceed the time limit and
20   there is a read command waiting to be executed, the
write command is retried after the dummy data has been
transferred to the host.